**HEIDENHEIN**

To the European Patent Office

80298 Munich

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| PAT/Kg Gerhard Pregler | 8.12.2005 |

European Patent Application no. 03701588.0-2302
PCT application no. PCT/GB2003/00266
Applicant: Renishaw plc
Our ref. D766/Pr

**Objection to patentability in accordance with Article 115 EPÜ:**

**Grounds:**

The subject to European patent application 03701588 is not patentable:

1.1 The independent claim 1 defines a process. In the preamble, and therefore in the view of the applicant, it is based on a process according to US 4,932,131, where scale markings are applied to a scale substrate by means of a laser by controlling a relative movement between the laser and the substrate via a control device and also controlling the operation of the laser via the control device to transmit light pulses.

A recognised disadvantage is that the laser radiation can have a detrimental thermal effect on the substrate.

This problem is solved according to the characterising part of claim 1 by the fact that the laser emits ultra-short light pulses so that the markings are formed on the substrate through laser ablation.

1.2 This process is not patentable on the basis of US 4,932,131 in conjunction with DE 196 08 937 A1.

The content of US 4,932,131 named in European patent application no. 03701588 evidently forms the preamble of claim 1.

US 4,932,131 discloses a process for making marks on a scale with the aid of a processor unit as the control device (cf. in particular column 5, lines 49-51). In this case, the movement of the writing device is controlled relative to the scale (cf. column 6, lines 43-51). The fact that a laser is used as the writing device is disclosed in column 8, lines 19-25.

If, with such a writing process, the average person has the problem of the thermal effect on the scale, he will look around the area of making a scale using a laser and consider DE 196 089 937 A1 to solve his problem. DE 196 08 937 A1 concerns making the markings of a scale using a pulsed laser. Column 2, lines 4 to 11 discloses that an energy dissipation (change to heat) in the processing area can be avoided if the laser transmits pulses for a much shorter time than 20 ns. This disclosed pulse time clearly includes "ultra-short output pulses". Through these short laser pulses, the markable layer T1 according to Fig. 1 can be partly roughened and the division-forming area TS1 formed. This roughening results from the melting of layer T1 (cf. column 2, lines 1 to 4). This melting corresponds to "laser ablation", because in this case, material also evaporates. This material removal is also illustrated in the diagrams by showing the division-forming area TS1 set back in relation to the untreated surrounding area.

Since DE 196 08 937 A1 discloses the advantage of the small heat input when using ultra-short laser pulses, he will also use this process for the process described in US 4,932,131 if the heat input has to be minimised there.

Therefore, the process defined in claim 1 does not satisfy the requirements of patentability, because it is disclosed in full to the average person skilled in the art from the state of the art.

2.1. The other independent claim 19 defines a device for performing the process according to claim 1.

2.2. This device has features that are disclosed in full from US 4,932,131. The device is only determined through device features that are defined in the preamble of claim 19. In the view of the patent holder, the new device differs from the device known from US 4,932,131 through the features of the characterising part, i.e. that the pulses are ultra-short pulses. However, the device cannot be defined as different from US 4,932,131 through this feature; at best, this feature defines a new method of operation of the known device, but which is not patentable, as stated above.

The device defined in claim 19 is not new in relation to the subject of US 4,932,131

3.1. The other independent claim 37 defines a scale with markings, made by laser pulses, the pulses being "ultra-short ablative pulses".

3.2. Such a scale is described in DE 196 08 931 A1. DE 196 08 937 A1 discloses a process for making division structures TS of a scale using a laser (cf. claim 1), the length of a pulse being considerably shorter than 20 ns (column 2, lines 1 to 7), i.e. "ultra-short".

Through the disclosure of the process, the scale made with this process, which is also illustrated in the diagrams of DE 196 08 937 A1, is also disclosed.

Therefore, the subject of claim 37 is not new.

4. The dependent claims only contain the usual technical measures. Therefore, the items or processes defined with them are not patentable. In this connection, we refer only to DE 30 42 650 A1 and US 4,406,939 at the moment.

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Duplicate of this letter
US 4,932,131 (in duplicate)
DE 196 08 937 A1 (in duplicate)
DE 30 42 650 A1 (in duplicate)
US 4,406,939 (in duplicate)